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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Haulk et al.

Serial No.: 10/044,535

Filed: January 11, 2002

For: METHODS AND APPARATUS FOR ERROR DETECTION AND
CORRECTION OF AN ELECTRONIC SHELF LABEL SYSTEM
COMMUNICATION ERROR

Group: 2133

Examiner: Kerveros, James C.

Durham, North Carolina
July 15, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Sirs:

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1. Appellant's Brief (18 pages).

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Signature

Date: July 15, 2005

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of : Haulk et al.
For : Methods and Apparatus for Error Detection
and Correction of an Electronic Shelf Label
System Communication Error
Serial No. : 10/044,535
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MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
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APPELLANT'S BRIEF

Sir:

1. The Real Party In Interest

The real party in interest is the assignee, NCR Corporation.

2. Related Appeals and Interferences

None.

3. Status of the Claims

This is an appeal from the March 11, 2005 final rejection of claims 1-16, all of the pending claims. Claims 1-16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Brieche U.S. Patent No. 5,704,049 ("Brieche"). Pending claims 1-16 are the subject of this appeal.

4. Status of Amendments

The claims stand as last amended on August 26, 2004. No claim amendment after-final has been filed.

5. Summary of Claimed Subject Matter

A system according to an aspect of the present invention comprises a host computer communicating with a plurality of electronic shelf labels (ESLs). Specification, page 4, line 15 – page 5, line 7 and Fig. 1. Each ESL includes registers or other similar memory space for storing information. Specification, page 6, lines 21-22. Information for storage in the ESL registers is communicated to each ESL by the host computer. Specification, page 7, lines 6-8. The host computer maintains awareness of the information to be stored in each ESL register. Specification, page 6, lines 1-11. Whenever the host computer transmits an initial message to the ESL, the host computer awaits a response from the ESL. Specification, page 9, lines 12-13 and steps 304 and 310 of Fig. 3. When a response is received from the ESL that is interpreted as a positive acknowledgement, a verification message is sent to the ESL to test the content of the ESL's registers. Specification, page 9, lines 17-20 and step 308 of Fig. 3. The host computer awaits a response to the verification message from the ESL. Specification, page 9, lines 22 and step 310 of Fig. 3. If a response is received, it is evaluated to determine if it indicates that the contents of the ESL's registers match the expected values as maintained by the host computer.

Specification, page 8, lines 3-13. If the response to the verification message indicates a match, the initial response is logged as successful, verifying the positive acknowledgement to the previous initial response was not a false positive indication. Specification, page 10, line 2 and step 312 of Fig. 3.

Independent claims 1 and 12 address a method of automatically detecting and correcting communication errors which result in incorrect storage of data in an electronic shelf label's (ESL's) registers. According to representative claim 1, the claimed method includes transmitting an initial message from a host computer to the ESL. Specification, page 9, lines 10-12 and step 302 of Fig. 3. The method further includes waiting for a response to the initial message. Specification, page 9, lines 12-13 and step 304 of Fig. 3. If the response is a negative acknowledgement or no response is received by the host computer, the method includes retransmitting the initial message. Specification, page 9, lines 13-16 and step 306 of Fig. 3. If the response is interpreted by the host computer as a positive acknowledgement, the method includes transmitting a verification message to verify the contents of the ESL's registers. Specification, page 9, lines 17-20 and step 308 of Fig. 3. The method further includes waiting for a response to the verification message. Specification, page 9, line 22 and step 310 of Fig. 3. If the response to the verification message indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer, the method includes logging the initial message as successfully received. Specification, page 9, line 20 – page 10, line 2 and step 312 of Fig. 3.

Independent claim 7 addresses an electronic shelf label (ESL) system comprising an ESL 122 and a host computer 102. The ESL 122 displays information relating to an item associated with the ESL 122. Specification, page 6, lines 13-14. The ESL 122 also includes a plurality of

registers 210_a, 210_b, ... 210_n for storing data. The stored data includes information to be displayed by the ESL 122 and parameters used by the ESL 122 to control presentation and formatting of the information displayed. Specification, page 6, line 21 – page 7, line 5 and Fig. 2. The host computer transmits an initial message to the ESL, waits for a response to the message, and retransmits the initial message if the response is a negative acknowledgement or no response is received. Specification, page 7, lines 15-21. If the response to the initial message is interpreted by the host computer as a positive acknowledgement, the host computer transmits a verification message to verify the contents of the ESL's registers. Specification, page 7, line 21 – page 9, line 8. The host computer evaluates a response to the verification message to determine if the contents of the ESL registers match the expected contents maintained by the host computer. If so, then the positive response to the initial message has been validated. Specification, page 8, lines 21-23.

6. Grounds of Rejection to be Reviewed on Appeal

Claims 1-16 stand solely rejected under 35 U.S.C. § 103(a) as being unpatentable over Briechele.

7. Argument

The final rejection under 35 U.S.C. § 103 did not follow M.P.E.P. § 706.02(j) which states:

After indicating that the rejection is under 35 U.S.C. 103, the Examiner should set forth...the difference or differences in the claim over the applied reference,...the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and ... an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

As will be illustrated below, the claims of the present invention are not obvious in view of the sole reference relied upon by the Examiner.

A. Rejection under 35 U.S.C. § 103(a) over Briechle

The art rejections are not supported by the relied upon art. 35 U.S.C. § 103 which governs obviousness indicates that “differences between the subject matter sought to be patented and the prior art” are to be assessed based upon “the subject matter as a whole”. Analyzing the entirety of each claim, the rejection under 35 U.S.C. § 103 is not supported by the relied upon art as addressed further below. When making a rejection based 35 U.S.C. § 103 with a single reference, it is necessary to show how the single reference must be modified to meet the terms of the claims. However, as addressed further below, fairness requires an analysis of failure of others, the lack of recognition of the problem, and must avoid the improper hindsight reconstruction of the present invention. Such an analysis should consider whether the modifications are actually suggested by the reference rather than assuming they are obvious. The 35 U.S.C. § 103 rejection made here acknowledges deficiencies in the art and attempts to make up for those deficiencies by suggesting those deficiencies are an obvious modification of the art. In this rejection, the purported basis for suggesting a modification of the art is improperly founded in the teaching of the present invention. This approach constitutes impermissible hindsight and must be avoided. As required by 35 U.S.C. § 103, claims must be considered as a whole. When so considered, the present claims are not obvious.

Turning to the sole reference relied upon, Briechle is markedly different from the present invention and address problems only peripherally related to the solutions provided by the present invention. Briechle is entitled “Subglobal Area Addressing for Electronic Price Displays.” Briechle addresses a sub-global addressing technique to command one or more electronic shelf labels (ESLs) to perform a desired action. As an example of Briechle’s approach of sub-global addressing, if a group of ESLs were located on the same ESL rail and, thus, had a common rail

ID, say X, a gondola controller would issue a command with a rail ID X. In this way, each ESL having rail ID X would perform the requested command. Bricchle, col. 2, lines 47-63.

Bricchle's addressing scheme merely enables an ESL to respond to only commands which contain a characteristic shared by the ESL. Bricchle does not address the problem of detecting and correcting a communication problem by verifying the contents of an ESL with expected values in a host.

Claims 1 and 12

In stark contrast to Bricchle, the claimed aspect of the present invention addresses automatically detecting and correcting communication errors which result in incorrect storage of data in an ESL's register. If communication between an ESL and a host appears to be established by receiving a positive response to an initial message, the present invention transmits a verification message to verify the contents of the ESL's registers. Upon receipt of a verification message, the ESL generates a response containing, for example, a cyclic redundancy check (CRC) of the ESL's registers. Upon receipt of the response to the verification message, the host would generate a CRC based on the expected values of the ESL registers maintained at the host and compare the generated CRC with the received CRC. If the CRCs match, the host has advantageously determined that the contents in the ESL register match the expected contents maintained at the host. Thus, it is confirmed that communication between the host and the ESL has properly occurred and the initial message is logged as successfully received. Claim 1 reads as follows:

1. A method of automatically detecting and correcting communication errors which result in incorrect storage of data in an electronic shelf label's (ESL's) register, the method comprising the steps of:
 - (a) transmitting an initial message from a host computer to the ESL;
 - (b) waiting for a response to the initial message;
 - (c) if the response is a negative acknowledgement or no response is

received by the host computer, retransmitting the initial message;

(d) if the response is interpreted by the host computer as a positive acknowledgement, transmitting a verification message to verify the contents of the ESL's registers;

(e) waiting for a response to the verification message; and

(f) if the response to the verification message indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer, logging the initial message as successfully received. (emphasis added)

As admitted by the Official Action, Briechele does not explicitly disclose steps (d), (e), and (f) in its textual discussion. (emphasis added) Final Official Action mailed March 11, 2005 at page 4, lines 3-6. The Official Action relies on Figs. 5a, 5b, and 10, and col. 14, lines 43-49 as purportedly teaching these steps. Applicants respectfully disagree. Figs. 5a and 5b of Briechele illustrate a method of how an ESL determines whether to process a request included in a received message. First, the ESL in Briechele at step 141 checks a CRC to determine at the ESL if the message was received clearly. Unlike the present invention, this use of the CRC does not verify the contents of the ESL at the host. The CRC in Briechele is merely used to determine whether the received message itself was clearly received. Eventually as illustrated at Fig. 5b of Briechele, if sub-global addressing is used and the ESL ID is in the range specified in the message, the ESL performs the requested action indicated in the message or command.

In Fig. 10, Briechele addresses a second use of a CRC in the context of his global addressing scheme to overcome the difficulty of two or more ESLs responding at the same time to a global query. Briechele, col. 13, lines 63-67. At col. 14, lines 43-49 of Briechele, the cited text describes resetting a global flag which is used to control whether or not the ESL responds to a global query. Briechele's global flag control has nothing to do with verifying the contents of an ESL's registers with expected values maintained at a host computer as claimed. In contrast with the present invention, the problem that Briechele addresses in Fig. 10 is introduced by global addressing which may cause multiple ESLs to respond to a single message.

The Official Action suggests that it would have been obvious to transmit a "verification message" which includes the step of executing the CRC check of step 141 as taught by Brieche for the purpose of "performing redundant CRC retransmission in order to verify proper CRC code transmitted with the data message, since a second CRC transmission will ensure data integrity due to redundancy." Applicants respectfully disagree on multiple grounds. As described above, a first application of CRC discussed in Brieche is to determine at the ESL whether the received message is clearly received. As illustrated at step 355 of Fig. 10, Brieche makes a second use of a CRC to determine whether two ESL's responses have collided at the host. In either of these two applications of a CRC, Brieche does not teach and does not suggest that "the verification message indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer," as claimed in claims 1 and 12.

Second, there is nothing in Brieche which suggests performing a second CRC transmission as suggested by the Official Action. Although the present specification at page 8, lines 7-13 discloses a second CRC transmission where the CRC is based on the contents of the ESL registers, to utilize such a suggestion from the present specification is clearly improper hindsight and must be avoided. If anything, Brieche's failure constitutes evidence of a failure of others indicative of nonobviousness rather than obviousness.

Third, performing a second CRC transmission as suggested by the Official Action in the manner suggested by Brieche at step 141 of Fig. 5a would only re-verify that the message is clearly received which was already known in the first CRC transmission. It would not verify that "the contents of the ESL's registers match the expected contents," as claimed in claims 1 and 12. Thus, no additional information would be obtained by the second transmission.

Clearly, the relied upon art does not teach and does not render obvious such a technique.

Thus, independent claims 1 and 12 are allowable over the relied upon art.

Claims 2 and 13

Claims 2 and 13 depend directly from claims 1 and 12, respectively, incorporating all of the limitations thereof and adding further limitations thereto. Claims 2 and 13 are allowable based upon their dependence on allowable independent claims 1 and 12. In addition, claims 2 and 13 further comprise the step of retransmitting the initial message, if the response to the verification message is a negative acknowledgement or no response is received by the host computer. This additional step provides an advantageous corrective step when a positive response for a previously received positive acknowledgement to an initial message is interpreted as a false positive indication. For example, when the positive acknowledgement to an initial message is interpreted by the host as being proper, but a negative acknowledgement to a subsequent verification message is received, the host deduces that the positive acknowledgement was a false positive. Claims 2 and 13 addresses a step to correct this false positive indication by reciting "re-transmitting the initial message."

The Official Action admits that Briechele does not explicitly disclose the features of these claims but again relies on step 355 of Fig. 10 of Briechele which merely addresses the situation where two responses from two ESLs collide at a host as a result of Briechele's global addressing scheme. The Official Action goes on to say that it would be obvious "to retransmit the message upon receiving a NACK due to error transmission, as taught by Briechele, as to reassure that the correct data were received by the label registers." Applicants respectfully disagree. If retransmission occurred in Briechele after step 355 of his Fig. 10 as suggested, it would result in one or more ESLs resending their transmissions' to the host, causing the CRC check at the host to again fail. Although retransmitting messages which were themselves negatively

acknowledged may be obvious, that is not what is claimed here. These claims address retransmitting an initial message from the host to the ESL which was previously acknowledged with a positive acknowledgement only after a subsequent verification message was negatively acknowledged.

Claims 3 and 14

Claims 3 and 14 depend directly from claims 1 and 12, respectively, incorporating all of the limitations thereof and adding further limitations thereto. Claims 3 and 14 are allowable based upon their dependence on allowable independent claims 1 and 12. Claims 3 and 14 address an advantageous corrective feature of “providing an indication of a [false positive] communication problem.” Rather than retransmitting the initial message as in claims 2 and 13, claims 3 and 14 address providing an indication that a false positive communication error has occurred. As described above, Briechele does not address the problem of a false positive communication error and, thus, does not teach and does not suggest the features of claims 3 and 14 as claimed. Recognition of a false positive communication problem allows evaluation of the problem to occur and corrective steps to be taken where appropriate. Briechele is silent in this respect.

Claim 7

With regard to the failings of Briechele discussed above, claim 7 is patentable in a similar manner as claims 1 and 12. Claim 7 addresses an electronic shelf label system comprising an ESL and a host computer. As mentioned in the Background section of the specification, prior ESL systems may suffer from misinterpreting noise or other interference as positively acknowledging an ESL when the ESL actually sends a negative response or no response at all, resulting in an error or false positive. To address such problems, claim 7 claims “a host

computer system transmitting an initial message to the ESL ... transmitting a verification message to verify the contents of the ESL's registers if the response to the initial message is interpreted by the host computer as a positive acknowledgement, the host computer being operative to evaluate a response to the verification message to determine if the response indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer." By transmitting a verification message after an initial message appeared to be received successfully, the present invention can determine whether the initial message actually indicated a successful reception or was the result of an error or false positive.

Brieche's sub-addressing scheme does not address the problem of determining whether a response received by a host is a false positive indication of successful transmission. Brieche does not teach and does not suggest the combination of elements cooperating as claimed in claim 7.

Overall, Applicant is somewhat puzzled by the Examiner's response to the previously submitted arguments and the apparent refusal of the Examiner to consider both the plain language and the context of the present claims. The relied upon reference fails to recognize the problem of detecting and correcting false positive communication errors. The relied upon reference fails to address this problem in the manner advantageously addressed by the present claims. Nothing in the cited reference indicates a recognition of this problem addressed by the present invention. Further, nothing in the cited reference indicates a system which would solve the problems addressed by the present invention. The claims as presently presented are not taught, are not inherent, and are not obvious in light of the art relied upon.

**C The Examiner's Findings of Obviousness are
Also Contrary to Law of the Federal Circuit**

As shown above, the invention claimed is not suggested by the relied upon prior art.

Furthermore, it is impermissible to use the claims as a frame and a prior art reference as a mosaic to piece together a facsimile of the claimed invention. *Uniroyal*, 837 F.2d 1044, 1051, 5

U.S.P.Q. 2d 1434, 1438 (Fed. Cir. 1988), cert. den., 109 S.Ct. 75, 102 L.Ed. 2d 51 (1988).

Similarly, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re *Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989), quoting In re *Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). No such suggestion is found here.

In addition, the Examiner does not appear to have considered where the reference diverges and teaches away from the claimed invention, *Akzo N.V. v. International Trade Commission*, 808 F.2d 1471, 1481, 1 U.S.P.Q. 2d 1241, 1246 (Fed. Cir. 1986), cert. den., 107 S.Ct. 2490, 482 U.S. 909, 107 S.Ct. 2490 (1987); and *W.L. Gore Associates, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); nor has the Examiner read the claims as a whole, as required by statute. 35 U.S.C. §103. See also, *Smithkline Diagnostics Inc. v. Helena Laboratories Corp.*, 859 F.2d 878, 885, 8 U.S.P.Q. 2d 1468, 1475 (Fed. Cir. 1988); and *Interconnect Planning Corp.*, 774 F.2d at 1143, 227 U.S.P.Q. at 551.

In *In re Laskowski*, 871 F.2d 115, 10 U.S.P.Q. 2d 1397, the Federal Circuit reversed an obviousness rejection of the claims in an application for a bandsaw. The claimed bandsaw used a pulley type wheel loosely fitted with a tire. The primary reference showed a similar bandsaw where the band was tightly fitted. The Federal Circuit stated that the prior art did not provide a suggestion, reason or motivation to make the modification of the reference proposed by the

Commissioner. *Id.* at 1398. The Court added that “there must be some logical reason apparent from the positive, concrete evidence of record which justifies a combination of primary and secondary references.” *Id.* quoting *In re Regel*, 526 F.2d 1399, 1403, 188 U.S.P.Q. 136, 139 (C.C.P.A. 1975), citing *In re Stemmiski*, 444 F.2d 581, 170 U.S.P.Q. 343 (C.C.P.A. 1971). Such a rationale is also applicable where the rejection suggests it is obvious to modify a single reference.

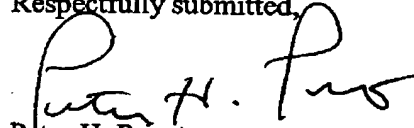
In *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q. 2d 1434 (Fed. Cir. 1988), cert. den., 109 S. Ct. 75, 102 L.Ed. 2d 51 (1988), the Federal Circuit reversed the District Court’s finding that the claims for a patent for an air flow deflecting shield were obvious. Without any suggestion in the art, the District Court improperly chose features from several prior art references to recreate the claimed invention. Such a conclusion is even stronger where the sole reference admittedly lacks the claimed combination of features and provides no implicit or explicit suggestion for its modification in the manner proposed by the Official Action.

The Examiner’s rejection suggests that the Examiner did not consider and appreciate the claims as a whole. The claims disclose a unique combination with many features and advantages not shown in the art. It appears that the Examiner has oversimplified the claims and then searched the prior art for the constituent parts. Even with the claims as a guide, however, the Examiner did not recreate the claimed invention.

9. Conclusion

The rejection of claims 1-16 should be reversed and the application promptly allowed.

Respectfully submitted,



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CLAIMS APPENDIX
(Claims Under Appeal)

1. A method of automatically detecting and correcting communication errors which result in incorrect storage of data in an electronic shelf label's (ESL's) registers storing incorrect data, the method comprising the steps of:

- (a) transmitting an initial message from a host computer to the ESL;
- (b) waiting for a response to the initial message;
- (c) if the response is a negative acknowledgement or no response is received by the host computer, retransmitting the initial message;
- (d) if the response is interpreted by the host computer as a positive acknowledgement, transmitting a verification message to verify the contents of the ESL's registers;
- (e) waiting for a response to the verification message; and
- (f) if the response to the verification message indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer, logging the initial message as successfully received.

2. The method of claim 1 further comprising the step of:

- (g) if the response to the verification message is a negative acknowledgement or no response is received by the host computer, retransmitting the initial message.

3. The method of claim 1 further comprising the step of:

- (h) if the response to the retransmitted initial message is a negative acknowledgement or no response is received by the host computer, providing an indication of a communication problem.

4. The method of claim 1 wherein the initial message is a command to update at

least one of the ESL's registers.

5. The method of claim 1 wherein the verification message is a data bedcheck message.

6. The method of claim 1 wherein the step of transmitting a verification message immediately follows the receipt of the positive acknowledgement.

7. An electronic shelf label (ESL) system comprising:

an ESL for displaying information relating to an item associated with the ESL, the ESL including a plurality of registers for storing data, the data including information to be displayed by the ESL and parameters used by the ESL to control presentation and formatting of the information displayed; and

a host computer system transmitting an initial message to the ESL, waiting for a response to the message, retransmitting the initial message if the response is a negative acknowledgement or no response is received, and transmitting a verification message to verify the contents of the ESL's registers if the response to the initial message is interpreted by the host computer as a positive acknowledgement, the host computer being operative to evaluate a response to the verification message to determine if the response indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer.

8. The system of claim 7 wherein the host computer waits for a response to the verification message, and if the response to the verification message is a positive acknowledgement, logging logs the initial message as successfully received.

9. The system of claim 7 wherein the message is a command to update at least one of the ESL's registers.

10. The system of claim 7 wherein the verification message is a data bedcheck

message.

11. The system of claim 7 wherein the step of transmitting a verification message immediately follows the receipt of the positive acknowledgement.

12. A method of automatically detecting and correcting communication errors which result in incorrect storage of data by an electronic shelf label's (ESL's) registers, the method comprising the steps of:

- (a) transmitting a an initial message from a host computer to an ESL, the initial message containing data to be stored in one or more registers of the ESL;
- (b) waiting for a response to the initial message;
- (c) if the response is a negative acknowledgement that the data was not correctly stored or no response is received by the host computer, retransmitting the initial message;
- (d) if the response is interpreted by the host computer as a positive acknowledgement that the initial message was received and the data correctly stored, transmitting a verification message to verify the contents of the ESL's registers;
- (e) waiting for a response to the verification message; and
- (f) if the response to the verification message indicates that the contents of the ESL's registers match the expected contents as maintained by the host computer, logging the initial message as successfully received.

13. The method of claim 12 further comprising the step of:

- (g) if the response to the verification message is a negative acknowledgement or no response is received by the host computer, retransmitting the initial message.

14. The method of claim 13 further comprising the step of:

- (h) if the response to the retransmitted initial message is a negative acknowledgement

or no response is received by the host computer, providing an indication of a communication problem.

15. The method of claim 12 wherein the step of transmitting a verification message immediately follows the receipt of the positive acknowledgement.

16. The method of claim 13 wherein steps (a) through (g) are repeated a plurality of times and further comprising the step of:

tabulating statistical data of the number of times the response was a negative acknowledgement or no response was received; and

providing an error indication if the number exceeds a threshold.